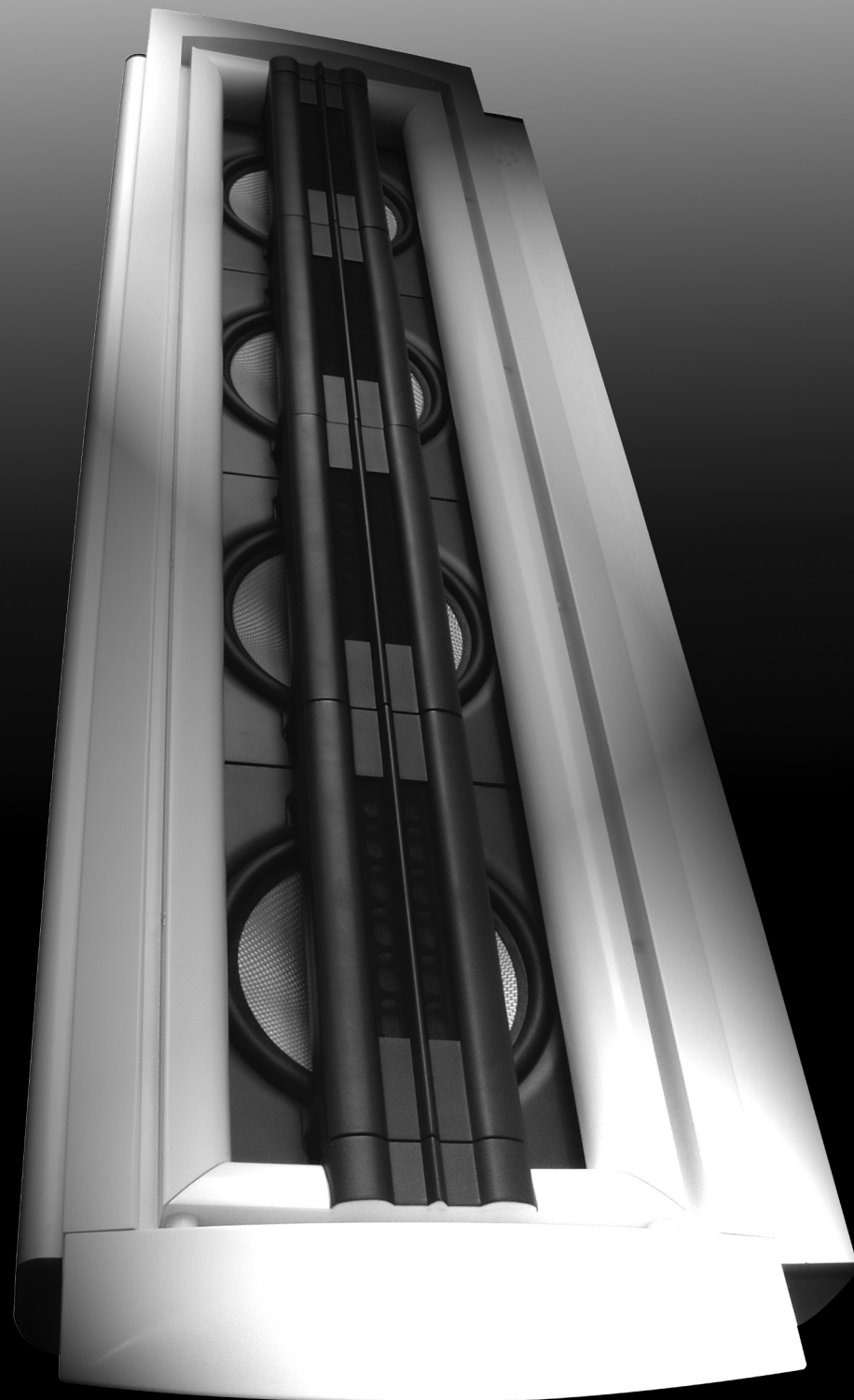


OWNER'S MANUAL

Starlet Series

Starlet 4 / Starlet 6 / Starlet 9

Line Source In-Wall Speakers



SpeakerCraft®

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GETTING STARTED

Your Starlet 4, 6 or 9 speakers are individually packed with the following:

- Back Box/Driver Assembly
- Bezel/Flange Assembly
- Cardboard Cut-Out Template and Paint Mask
- Accessory Pack (See Diagram 1)
 - Outer Bracket
 - Inner Bracket
 - Foam Support Block
 - Screws: Two M4 x 20mm for Outer/Inner Bracket
Two Hex Head M4 x 45mm Screws per Driver
(8 for Starlet 4, 12 for Starlet 6 and 18 for Starlet 9)
 - 3mm Hex Head M4 Driver Bit (for electric screwdriver)

Also available separately for the Starlets 6 and 9:

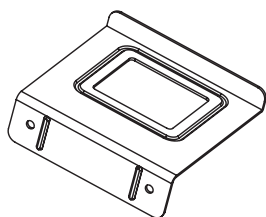
- SCT-1.0 Starlet Calibration Tools
 - ASM89000: Complete Kit with Test CD and Analog Voltmeter with Leads
 - ASM89001: Test CD Only

For installation of your Starlets, you will need the following:

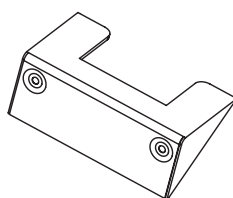
- Stud Finding Tool
- Drywall Saw
- Electric Screwdriver
- Hand Screwdriver with #2 Phillips Head
- Pencil (for marking wall)
- Masking tape or tacks (for template)
- Level
- Wire Strippers
- Utility Knife
- Tape Measure

Amplifier Requirements:

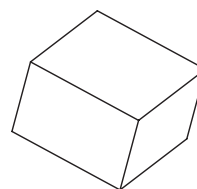
- Starlet 4: Minimum 75 watts per channel stereo amplifier with low impedance capability (i.e. SpeakerCraft BB275)
- Starlets 6 and 9: Two (2) minimum 75 watts per channel stereo amplifiers with low impedance capability and individual level controls on each channel
- The SpeakerCraft BB275 is a good starting point for all 3 models of the Starlet



Outer Bracket



Inner Bracket



Foam Support Block



M4 x 20mm Screws for
Outer / Inner Bracket



Hex Head M4 x 45mm Screws
(2 per Driver)



3mm Hex Head M4 Driver Bit
for Electric Screwdriver

Diagram 1:
Accessory Pack

SPEAKER PLACEMENT

SpeakerCraft highly recommends the use of a qualified custom installation specialist when installing your Starlet speakers. Please note that all Starlet models require a separate powered subwoofer. In addition, the Starlets 6 and 9 are bi-amplified and require precise electrical adjustment with a voltmeter and test CD. If this sounds intimidating please consult an expert. You can get assistance in locating an installation specialist please by contacting SpeakerCraft at 1-800-448-0976.

UNIQUE CHARACTERISTICS OF THE STARLET SERIES

All three Starlet models are the world's first coincident in-wall line sources. They have acoustical properties that will produce great advantages in custom installations, but there is one factor that the installer must be aware of when specifying which model to use and when determining the best listening location.

A pair of Starlets produce a startling and clear stereo image, making a center speaker unnecessary in many installations. However, the high frequency output of a line source is only audible to listeners whose ear level is directly in line with the speaker array. In other words, if a pair of Starlets are installed at seated ear level and if the listener stands up, so that his or her ears are above the top of the top speaker, the high notes will vanish. (See **Diagram 2**) This is the reason why very long Starlet models are made available. In a large room where people are going to be listening while seated or standing, the two larger models (Starlets 6 or 9) are optimum.

By "coincident", we mean that the acoustic center of the woofer (low frequency) array and the acoustic center of the tweeter (high frequency) array are lined up. This means that there are no frequency shifts to the right or left side of the speaker, and this advantage is why the image produced by the Starlets is superior to any previous in-wall speaker.

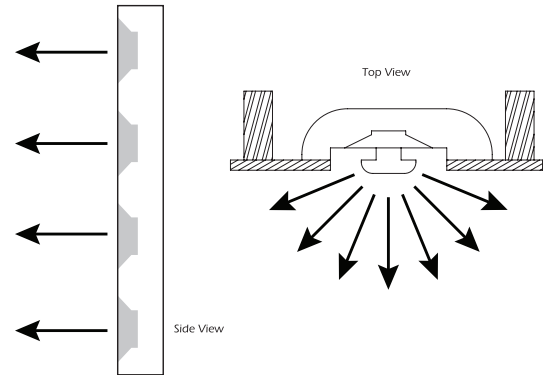


Diagram 2:
Side and Top Views of
Line Source Sound Dispersion

INSTALLATION HEIGHT

SpeakerCraft's engineers have experimented extensively with the correct height for Starlets and recommend that the installer determine the listener's seated ear height.

For the best sonic balance and image, the center of any Starlet model should be located 5" to 7" above this ear height. (See **Diagram 3**) In most of the rooms we have looked at, this means the center of the Starlet should be 48" to 49". On the Starlet 9, this means the top of the speaker will be about 7 feet high.

In rooms where the Starlets must be higher than this recommendation, it is imperative to make sure that the seated listening position be at least in line with the division between the lowest and the next-to-lowest driver module. If this cannot be achieved, use a larger Starlet model.

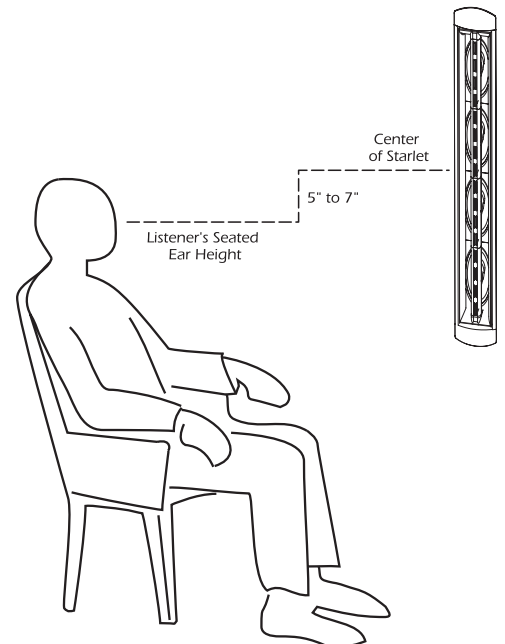


Diagram 3:
Listening Height

DECIDING DISTANCE APART

Consider how far apart the speakers should be. To do this, think of your listening area as a triangle with each leg of the triangle being equal. This equilateral triangle is the most distance you should have between your speakers relative to the normal listening position. (See Diagram 4)

CHECKING FOR OBSTRUCTIONS

Before confirming the placement of your Starlet speakers, you should carefully consider the location of studs, fire blocks, electrical, plumbing and other fixtures or obstructions that may get in the way. If you are installing the speakers into an existing wall, you can locate obstructions by noting the placement of wall fixtures and, if possible, gaining access to an attic or crawl space for further analysis. A good stud finder, found at any building supply store, will help you determine where the studs are located in the wall.

CLEARANCE NEEDED

Starlets are enclosed speakers that have their own enclosures and do not require any specific back volume or damping. The enclosure is asymmetrical, a total of 11¼" wide. There is no right or left, but the enclosure measures 6" from center on one side and 5¼" on the other. This will give the installer a little more room on one side if necessary. (See Diagram 5)

HOME THEATER APPLICATIONS

There are two options for front channel home theater use:

- A. Put one pair of speakers VERY close to the screen, and second pair out at the "magic equilateral triangle" point. The two speakers close to the screen would be wired as the center channel and the Starlet's excellent imaging and dispersion will take care of the rest. (See Diagram 6)
- B. Use a Starlet on its side for the center channel. (See Diagram 7)

REAR / SIDE CHANNELS

Starlets make excellent side or rear speakers provided the height installation limitations are followed.

INSTALLATION CONSIDERATIONS

Prior to the installation of your Starlets, it will be necessary to run cables to the speaker locations. There are some specific recommendations for the Starlets:

Starlet 4: It is very important to use the heaviest wire in the shortest length possible. 12 gauge or bigger in a length less than 25 feet is optimum. If possible double the cable, running two sets of 12 gauge to the Starlet 4.

Starlets 6 and 9 are less critical as to wire quality, but still require the largest wire practical.

Volume Control Warning: Performance of all Starlets will be seriously degraded if in-line speaker level volume controls are used.

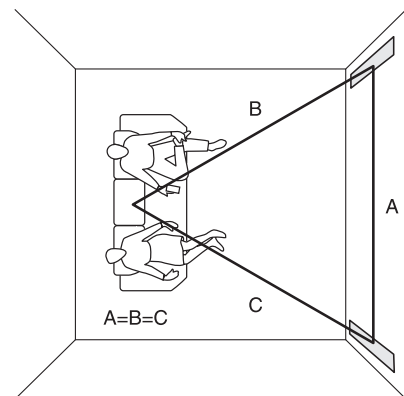


Diagram 4:
Distance Apart

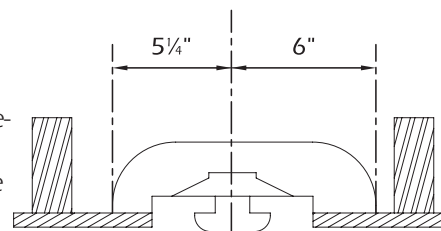


Diagram 5:
Asymmetrical Enclosure

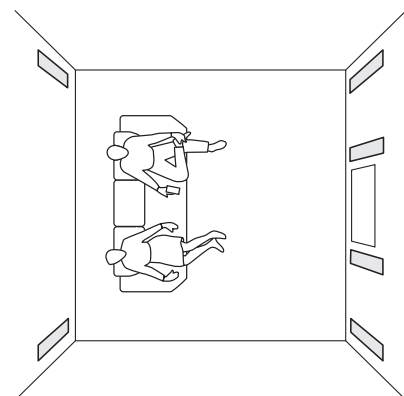


Diagram 6:
Home Theater, Option A

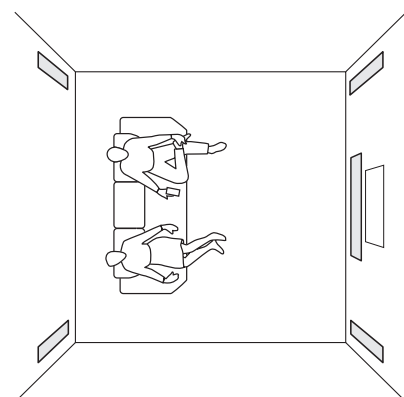


Diagram 7:
Home Theater, Option B

INSTALLATION PREPARATION

NEW CONSTRUCTION

Starlets are designed to be installed into a standing wall, therefore no new construction bracket is supplied.

There are some considerations for new construction to create the best possible sound:

- 1. Double Thick Drywall:** The clamp between the back box and front baffle is designed for $\frac{1}{2}$ " drywall (or any wall material in $\frac{1}{2}$ "). If you are planning double thick drywall, leave an area about 12" wide around the Starlet opening in single thickness. (See Diagram 8)
- 2. Starlets are Heavy:** Walls should be constructed with screws and the wallboard should be glued to the studs. A few dollars worth of Elmer's wood glue can work wonders in an in-wall installation.
- 3. Metal Studs:** Avoid these in a wall supporting Starlets
- 4. Wire Routing:** Install the speaker wires before the wallboard goes up (see "SPEAKER INSTALLATION" for wiring information)

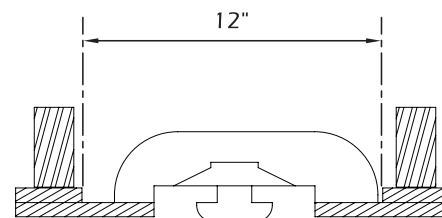


Diagram 8:
Double Drywall

FINISHED WALL

When installing the Starlets in a finished wall, please follow these instructions carefully:

- a. Determining Placement:** See "SPEAKER PLACEMENT" on pages 3-4.
- b. Locating Obstructions:** See "Checking for Obstructions" on page 4.
- c. Tracing the Cut-Out Template:** Your installation cut-out template is included in the packaging. Please be aware that there are two sections: one is the cut-out template and the other is the paint mask. Be careful not to confuse the two. Place the cut-out template at the location you have decided to install the Starlets. (See Diagram 9) Keep in mind that the flange will extend beyond the cut-out on the sides, top and bottom.

The cut-out takes into account the asymmetrical of the Back Box/Driver Assembly. This gives a degree of lateral freedom when installing the 11 $\frac{1}{2}$ " Back Box/Driver Assembly into a typical 14 $\frac{1}{2}$ " wide stud bay. There is no real "up" "down" to the Starlet, so use the cut-out template determine the best position for the speaker in order avoid obstructions and to get the best acoustic results. There is a correct way to install the baffle assembly, however, which is covered in the next section, "SPEAKER INSTALLATION".

With the above in mind, use a level along the top bottom edge of the template so that the cut-out will aligned correctly. Use tape or tacks to hold the template in place. Trace an outline of this pattern on the wall pencil. (See Diagram 10)

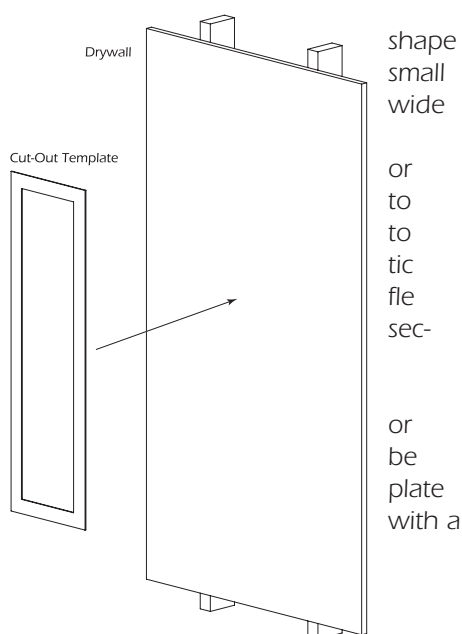


Diagram 9:
Placing the Cut-Out Template

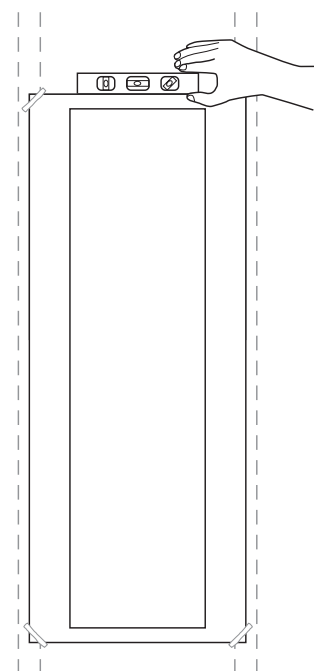


Diagram 10:
Aligning the Cut-Out Template

d. Cutting the Hole

CAUTION: This is the most important part of the entire installation. If you are not certain whether or not an obstruction exists behind the desired mounting area, you should conduct an obstruction survey by cutting small holes every 10" or 12" in the center of the cut-out area. Cut at a 45° angle towards the inside of the hole. Cutting the small hole at this angle will make drywall repair much easier as the piece cut out can be re-installed neatly back into the hole (in the case the location is not suitable). Once you have determined that there are no obstructions in the desired mounting area, start cutting the hole at a 90° angle to the wall surface. (See Diagram 11)

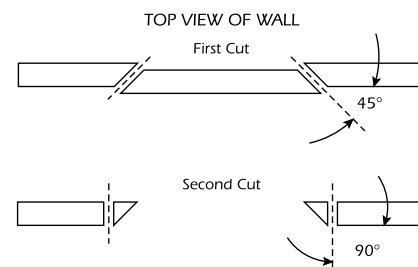


Diagram 11:
Cutting the Hole

e. Installing the Bracket

The Bracket comes in two pieces - Outer Bracket and Inner Bracket. The Outer Bracket should go on the outside of the drywall, and the Inner Bracket should go inside the drywall. Along the lower edge of the drywall cut-out, use the Outer Bracket as a template to mark the screwholes with a pencil. Drill two clearance holes for the mounting screws. The screws pass through the Outer Bracket and drywall and tighten into the Inner Bracket. (See Diagram 12)

Once assembled, the completed bracket will form a shelf to prevent the Back Box/Driver Assembly from falling into the wall cavity. (See Diagram 13)

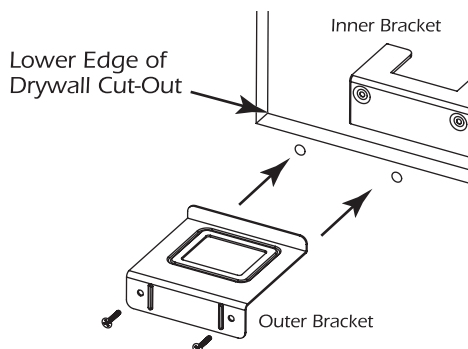


Diagram 12:
Bracket Assembly

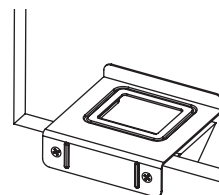


Diagram 13:
Completed Bracket

SPEAKER INSTALLATION

All Starlet models install in the same way. The wiring for the Starlet 4 differs from the bi-amplified Starlets 6 and 9. There are different procedures for mounting in a standard stud depth (2x4 framed wall) and deeper walls (2x6 or deeper). The supplied foam support block is intended for deeper walls.

The installation of Starlets is straightforward, but it is more difficult than smaller in-walls and following these directions is very important. Of course, the final result is the best performance available from an in-wall loudspeaker so it is worth the extra effort.

WIRING THE STARLET 4

All Starlets have binding post terminals on both ends of the back box. In the case of the Starlet 4, they are electrically identical, and allow the connection of wire to whichever end is easier. Optionally, they allow for bi-wiring by running parallel wires to each end of the speaker. As mentioned previously, heavy gauge wire in the shortest length possible is needed for the Starlet 4. (See Diagram 14)

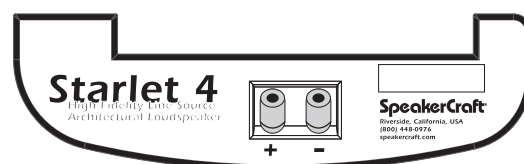


Diagram 14:
Starlet 4 Binding Posts

WIRING THE STARLETS 6 and 9

The Starlets 6 and 9 are bi-amplified, which means that one terminal is wired to a single amplifier channel and the other terminal is wired to a separate amplifier channel. Thus both terminals are always used in the Starlets 6 and 9. The end plate bearing the SpeakerCraft logo and product name is the woofer terminal, and is marked "woofers". The blank plate is the tweeter terminal, and is marked "tweeters". (See Diagram 15)

There are two options for bi-amping:

1. Use a single stereo amplifier for each speaker, with one channel for the woofer and the other for the tweeter. This option is preferred if you have two identical stereo amplifiers.
2. Use one amplifier for the woofers and a separate amplifier for the tweeters. This option is preferred if you have two different stereo amplifiers. In this case, the less powerful amplifier should be used on the tweeter section.

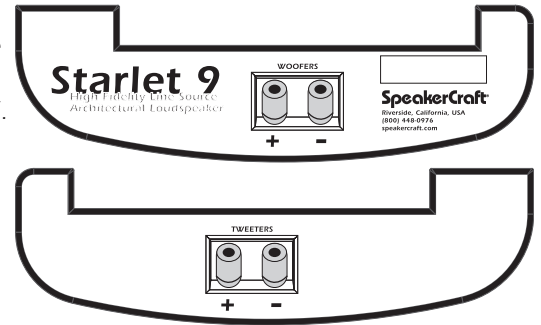


Diagram 15:
Starlet 6 and 9 Binding Posts

INSTALLATION IN A 2x4 STUD WALL

All Starlets are asymmetrical. Hold the Back Box/Driver Assembly by grasping the tweeters, being careful not to touch the voice coils behind the tweeters. The tweeter assembly is very strong, as the tweeter bridge is a cast aluminum part. On the larger Starlets, it is advisable to have an assistant. Insert the long side of the back box first, pushing it until the tweeter bridge stops further movement. Then slip the short side into the cavity, moving the Starlet until the tweeter bridge is centered. The proximity of the back wall will support the speaker while the rest of the installation is completed. (See Diagram 16)

The Bezel/Flange Assembly is installed into the Back Box/Driver Assembly, forming a strong clamp with the wall. Please observe that there are "tabs" on the back of the Bezel/Flange Assembly that fit into corresponding slots on the baffles. **They only fit one way, which is indicated by small arrows on these two parts.** Use the supplied M4 x 45mm hex head screws to secure the Bezel/Flange Assembly into the Back Box/Driver Assembly. For your convenience, we've enclosed the correct sized hex driver in the supplied Accessory Pack. It is strongly advised that you use a power screwdriver to save time and get a tight fit. Make sure all of these hex screws are firmly seated. (See Diagram 17 on page 8)

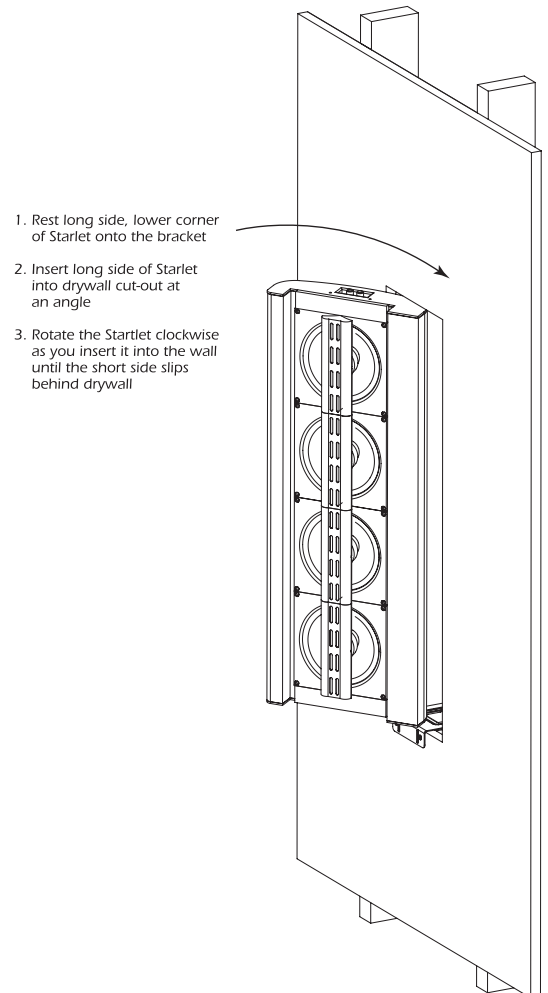


Diagram 16:
Insert Long Side of Back Box/Driver
Assembly into Drywall First

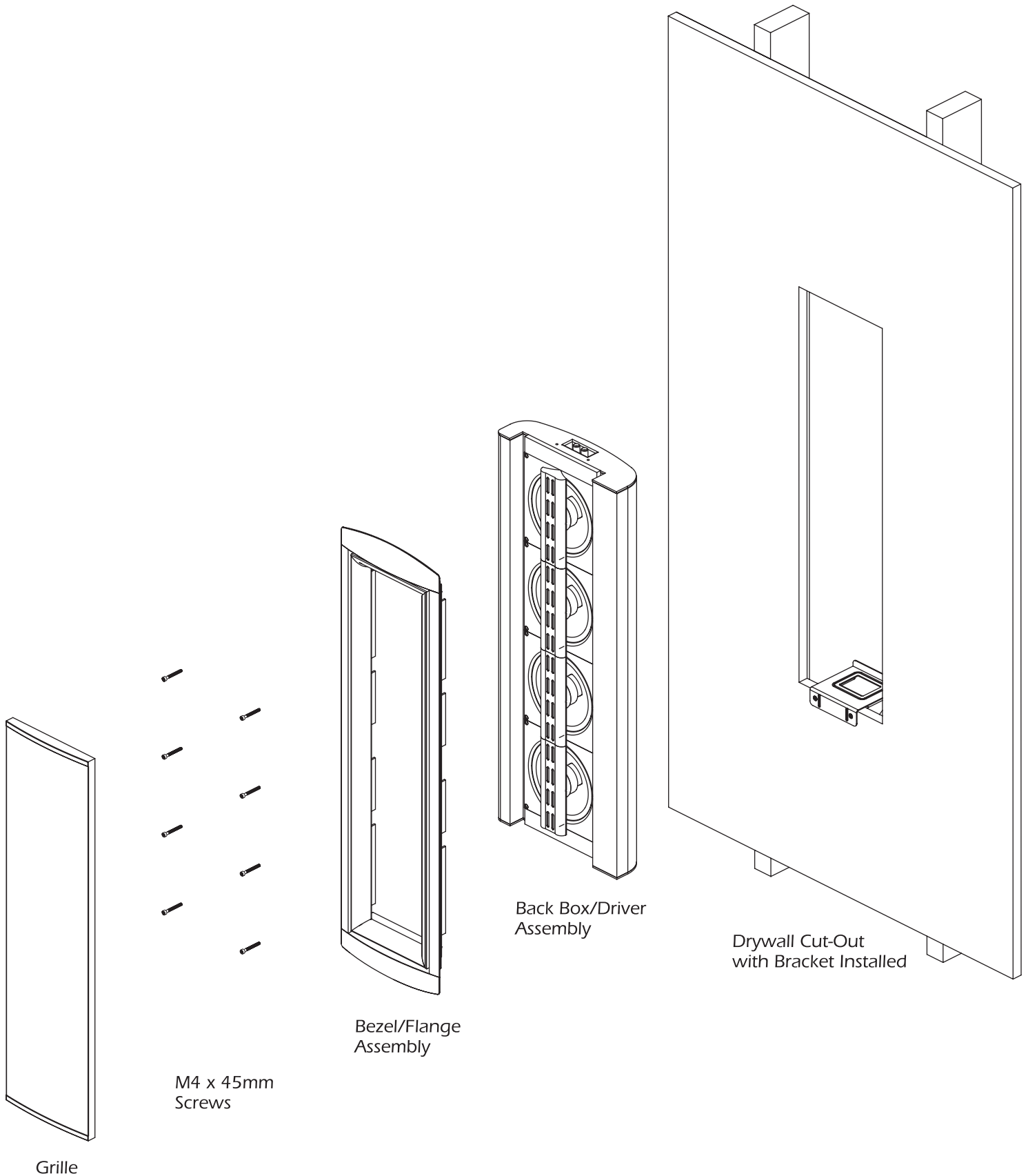


Diagram 17:
Exploded View of Installation

INSTALLATION IN A 2x6 OR DEEPER WALL

A Foam Support Block is provided in the Accessory Pack. This simple block helps keep the Back Box/Driver Assembly from falling into the wall cavity of a 2x6 wall while the speaker is being installed. Peel the tape off the foam block and place it onto the back of the Back Box/Driver Assembly on any location near the top. (See Diagram 18)

With the Foam Support Block installed, follow the steps described under "INSTALLATION IN A 2x4 STUD WALL" on page 7.

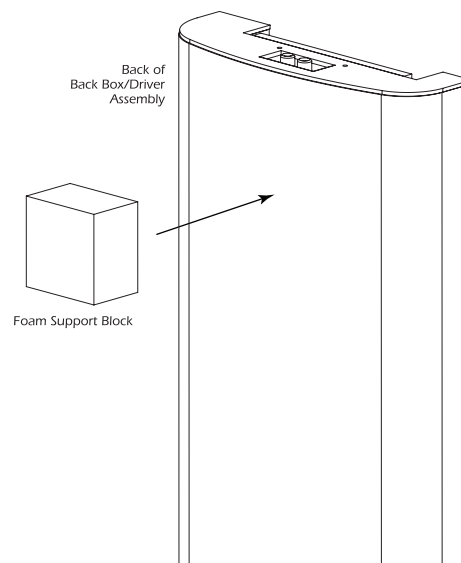


Diagram 18:
Foam Block Installation

GRILLE INSTALLATION

The grille assembly consists of the metal grille section, backed by a "scrim" cloth, and two plastic end caps. Due to its length, it is best to carefully and slowly push the grille as it is eased into position. When applying pressure, we highly recommend starting at the ends and then working your way towards the center. Inserting the grille from one end to the other is not recommended. (See Diagram 19)

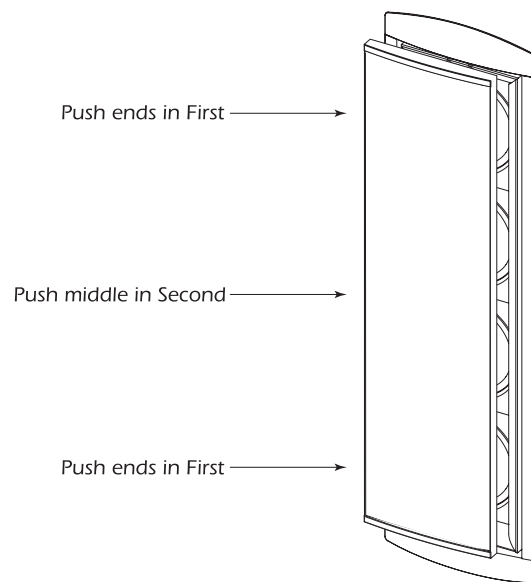


Diagram 19:
Grille Installation

PAINTING THE STARLETS

If you plan to paint your Starlets, we recommend that it be done prior to installation. If you decide to paint them sometime in the future, it is best to remove the Starlets by simply reversing the steps for "SPEAKER INSTALLATION" on pages 6-9.

When painting the Starlets, the paint masks provided in the carton must be installed in place of the grille. The grilles can also be painted, however, great care should be taken not to clog the holes, as this will greatly reduce the sound quality of the speakers. Before painting the grilles, remove the under grille material. Put this material back into place once the grille has been painted.

SpeakerCraft recommends only light spray painting, using 5 parts thinning agent to 1 part paint. Do not paint grilles while they are attached to the speaker. If it is necessary to paint the under grille material, follow the same procedure used to paint the grilles.

SPEAKER ADJUSTMENTS

STARLET 4 ADJUSTMENTS

The Starlet 4 does not require any special woofer or tweeter adjustments.

STARLETS 6 and 9 LEVEL ADJUSTMENTS

Even experienced listeners have a difficult time adjusting the bi-amp levels for the Starlets 6 and 9 by ear, so SpeakerCraft has developed a simple procedure for setting the level of the high and low frequency sections. When adjusted in this way, the sound suddenly gains focus and resolution.

The basic procedure consists of using a noise source, specifically pink noise, and adjusting the woofer and tweeter levels using an AC Voltmeter across the amplifier speaker outputs or the speaker inputs. Most installers should have both of these items, but if not, SCT-1.0 Starlet Calibration Tools may be purchased separately. The SCT-1.0 is available in two configurations: as a kit consisting of an appropriate voltmeter and a custom Test CD with a pink noise band or as a stand-alone Test CD. (See Page 2)

Procedure: After obtaining a pink noise source, which in most cases will be a test CD, set the master volume of the system to a very low level, so that you can hear that the noise is running. Set the trim pot on the woofer channel of the amplifier to "0" (full counter clockwise), and the tweeter level to "Max" (full clockwise). With your meter on the tweeter channel, turn the master volume to get a reading of 1.75 volts on the Starlet 6 or 3.75 volts on the Starlet 9. Move the meter leads to the woofer channel and advance the trim pot clockwise until you get a reading of 0.5 volts. (See Diagram 20)

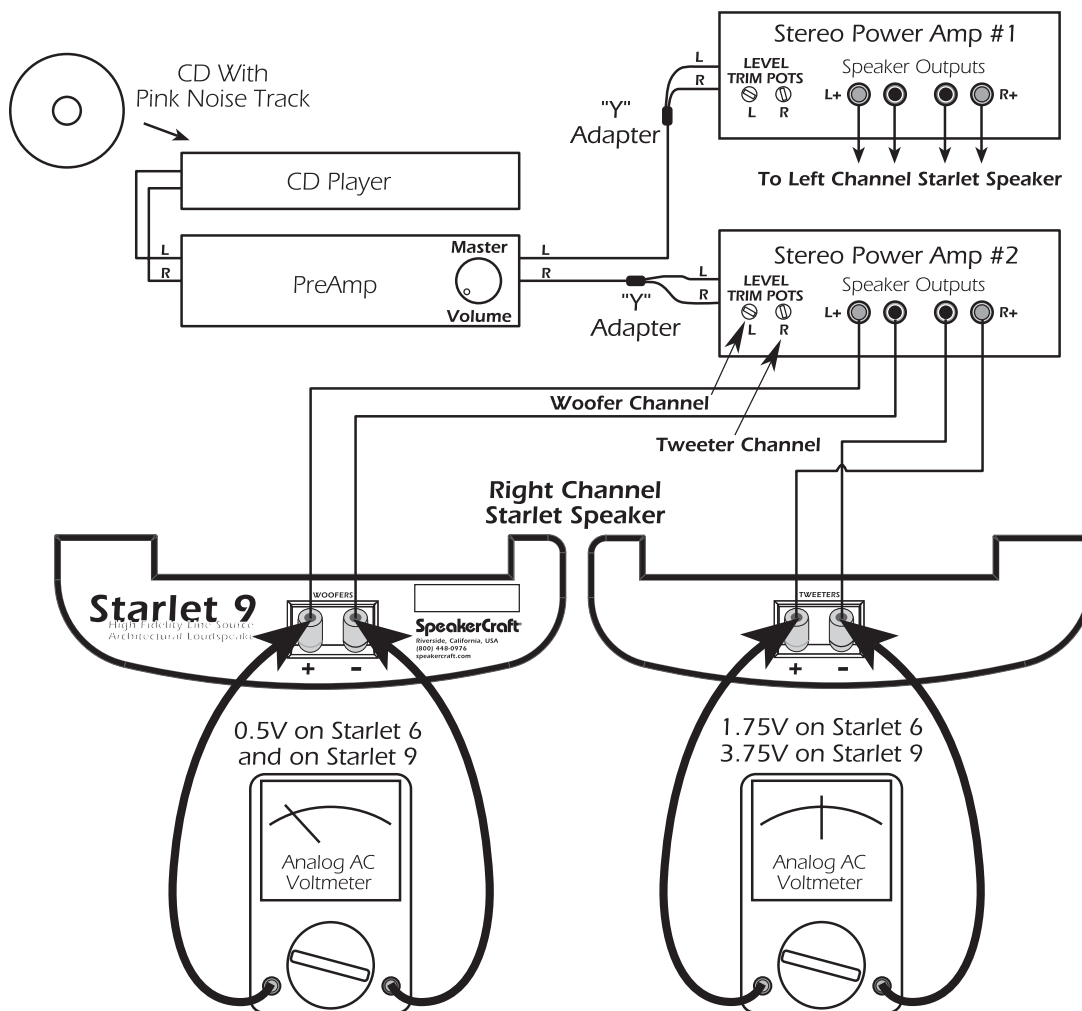


Diagram 20:
Starlets 6 and 9 Level Adjustments

A few notes, based on our experience:

1. It is best to set these levels on recessed volume controls, such as those on the SpeakerCraft BB series of amplifiers, as this adjustment is a one time, "set and forget" procedure.
2. All pink noise should be identical, but it isn't. The noise on SpeakerCraft's SCT-1.0 Test CD is known to work well in setting the levels.
3. Digital voltmeters can be problematic with pink noise. This is because pink noise "pumps" up and down a few dB and, even with an averaging meter, it can be hard to set the level to a medium of 0.5. For instance, we get readings of 0.45 to 0.55 when the level is set correctly. Also, many AC DMM's do not have a low voltage range.
4. Radio Shack has a low cost (\$24.95) voltmeter that has a 10 volt AC range, and works very well in this application.

SUBWOOFER ADJUSTMENTS

All Starlets are designed for high end systems where subwoofers are required. Unlike the midrange and tweeter settings, each room is so different in bass response that it is best to set the controls by ear. Here is our recommended starting point, based on the controls for SpeakerCraft's BassX-10 and BassX-12 subwoofers:

Start with the volume control at about 9 o'clock, the boost at about 10 o'clock, the frequency control at 10 o'clock and the phase control at 0°. (See Diagram 21) Slowly advance the volume until you hear a good balance. Here it helps to take the time to listen to several tracks in several locations in a room. If it is not possible to get bass without excess "boominess", rotate the boost back counterclockwise. If there are areas of the room where the bass seems to totally drop out, experiment by moving the phase to 180°.

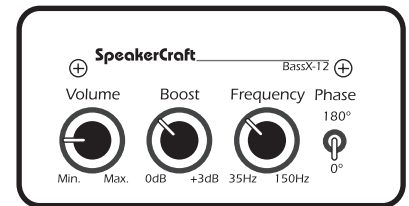


Diagram 21:
Subwoofer Adjustments

SPECIFICATIONS

	Starlet 4	Starlet 6	Starlet 9
Configuration:	4 Woofer / 4 Tweeter Line Source System	6 Woofer / 6 Tweeter Line Source System	9 Woofer / 9 Tweeter Line Source System
Woofers:	6½" Kevlar Cone Woofers with Front Mounted Neodymium Magnets	6½" Kevlar Cone Woofers with Front Mounted Neodymium Magnets	6½" Kevlar Cone Woofers with Front Mounted Neodymium Magnets
Tweeters:	4½" x ¾" Ribbon Tweeters Coaxially Mounted	4½" x ¾" Ribbon Tweeters Coaxially Mounted	4½" x ¾" Ribbon Tweeters Coaxially Mounted
Enclosure:	Sealed Back Box with an Extruded Wave Guide	Sealed Back Box with an Extruded Wave Guide	Sealed Back Box with an Extruded Wave Guide
Impedance:	6 Nominal	6 Nominal	6 Nominal
Sensitivity:	90dB 1W/1m	91dB 1W/1m	92dB 1W/1m
Frequency Response:	90Hz - 21kHz ± 2dB	90Hz - 21kHz ± 2dB	90Hz - 21kHz ± 2dB
Min. Power Requirements:	2 x 75 watts per speaker	2 x 75 watts per speaker	2 x 75 watts per speaker
Grille Frame Dimensions:	H 36¾" x W 9¼" x D 3¼"	H 52¼" x W 9¼" x D 3¼"	H 76¾" x W 9¼" x D 3¼"
Cut-Out Dimensions:	H 34¼" x W 8"	H 49½" x W 8"	H 73" x W 8"
Weight:	33 lbs	46 lbs	66 lbs

In our attempt to constantly improve our products, features and specifications are subject to change without notice.

LIMITED LIFETIME WARRANTY

SpeakerCraft Inc. warrants to the original retail purchaser **only** that this SpeakerCraft product will be free from defects in materials and workmanship, provided the speaker was purchased from a SpeakerCraft Authorized Dealer.

Defective products must be shipped, together with proof of purchase, prepaid insured to the SpeakerCraft Authorized Dealer from whom they were purchased, or to the SpeakerCraft factory at the address listed on this installation instruction manual. Freight collect shipments will be refused. It is preferable to ship this product in the original shipping container to lessen the chance of transit damage. In any case, the risk or loss or damage in transit is to be borne by the purchaser. If, upon examination at the Factory or SpeakerCraft Authorized Dealer, it is determined that the unit was defective in materials or workmanship at any time during this warranty period, SpeakerCraft or the SpeakerCraft Authorized Dealer will, at its option, repair or replace this product at no additional charge, except as set forth below. If this model is no longer available and can not be repaired effectively, SpeakerCraft, at its sole option, may replace the unit with a current model of equal or greater value. In some cases where a new model is substituted, a modification to the mounting surface may be required. If mounting surface modification is required, SpeakerCraft assumes no responsibility or liability for such modification. All replaced parts and product become the property of SpeakerCraft Inc. Products replaced or repaired under this warranty will be returned to the original retail purchaser, within a reasonable time, freight prepaid.

This Warranty does not include service or parts to repair damage caused by accident, disaster, misuse, abuse, negligence, inadequate packing or shipping procedures, commercial use, voltage inputs in excess of the rated maximum of the unit, or service, repair or modification of the product which has not been authorized or approved by SpeakerCraft. This Warranty also excludes normal cosmetic deterioration caused by environmental conditions. This Warranty will be void if the Serial Number on the product has been removed, tampered with or defaced.

This Warranty is in lieu of all other expressed warranties. If the product is defective in materials or workmanship as warranted above, the purchaser's sole remedy shall be repair or replacement as provided above. In no event will SpeakerCraft be liable for any incidental or consequential damages arising out of the use or inability to use the product, even if SpeakerCraft Inc. or a SpeakerCraft Inc. Authorized Dealer has been advised of the possibility of such damages, or for any claim by any other party. Some states do not allow the exclusion or limitation of consequential damages, so the above limitation and exclusion may not apply.

All implied warranties on the product are limited to the duration of this expressed Warranty. Some states do not allow limitation on the length of an implied warranty. If the original retail purchaser resides in such a state, this limitation does not apply.



CUSTOMER ASSISTANCE

Should you have any questions regarding this, or any other SpeakerCraft product, please call our toll-free service hotline at 1-800-448-0976. We are available to assist you every weekday, except holidays, between the hours of 7:00 a.m. and 5:00 p.m. PST.

SpeakerCraft offers a variety of accessories to make your installation of this and other SpeakerCraft products easy, economical, and professional. Contact your authorized SpeakerCraft Dealer for more information.

940 Columbia Avenue, Riverside, CA 92507
(800) 448-0976 Fax (951) 787-8747
www.speakercraft.com

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